**ENVIRONMENTAL QUALITY** COUNCIL 2017-18

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M O N T A N A September 28, 2017

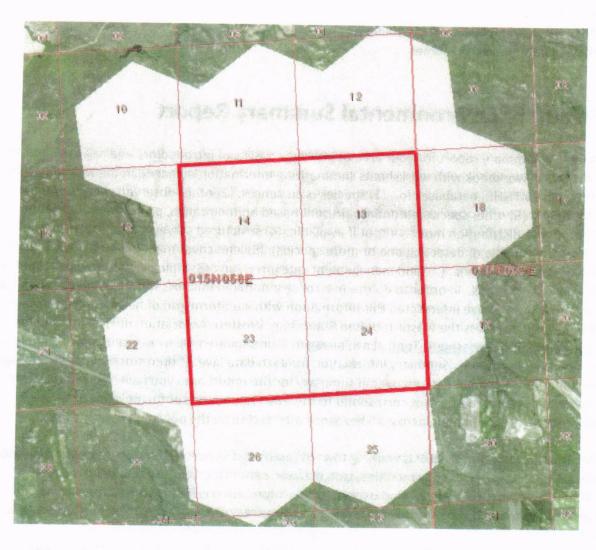
Exhibit 17

# Natural Heritage 1515 East 6th Avenue Helena, MT 59620 (406) 444-0241

mtnhp.org



Latitude Longitude 47.02038 -104.28313 47.07803 -104.37225



## **Suggested Citation**

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The Montana Natural Heritage Program is part of NatureServe – a network of over 80 similar programs in states, provinces and nations throughout the Western Hemisphere, working to provide comprehensive status and distribution information for species and ecosystems.









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# **Introduction to Environmental Summary Report**

The Environmental Summary report for your area of interest consists of introductory and related materials in this PDF and an Excel workbook with worksheets summarizing information managed in the Montana Natural Heritage Program's (MTNHP) databases for: (1) species occurrences; (2) other observed species without Species Occurrences; (3) other species potentially present based on their range, presence of associated habitats, or predictive distribution model output if available; (4) structured surveys (organized efforts following a protocol capable of detecting one or more species); (5) land cover mapped as ecological systems; (6) wetland and riparian mapping; (7) land management categories; and (8) biological reports associated with plant and animal observations. In order to do this in a consistent manner across Montana and allow for rapid delivery of summaries, we have intersected this information with a uniform grid of hexagons that have been used for planning efforts across the western United States (e.g. Western Association of Fish and Wildlife Agencies - Crucial Habitat Assessment Tool). Each hexagon is one square mile in area and approximately one kilometer in length on each side. Summary information for each data layer is then stored with each hexagon and those summaries are added up to an overall summary for the report area you have requested. Users should be aware that summaries do not correspond to the exact boundaries of the polygon they have specified, but instead are a summary across all hexagons intersected by the polygon they specified.

In presenting this information, MTNHP is working towards assisting the user with rapidly assessing the known or potential species and biological communities, land management categories, and biological reports associated with the report area. We remind users that this information is likely incomplete and may be inaccurate as surveys to document species are lacking in many areas of the state, species' range polygons often include regions of unsuitable habitat, methods of predicting the presence of species or communities are constantly improving, and information is constantly being added and updated in our databases. Field verification by professional biologists of the absence or presence of species and biological communities in a report area will always be an important obligation of users of our data. Users are encouraged to only use this environmental summary report as a starting point for more in depth analyses and are encouraged to contact state, federal, and tribal resource management agencies for additional data or management guidelines relevant to your efforts. Please see the Appendix for introductory materials to each section of the report, additional information resources, and a list of relevant agency contacts.



Aprogram of the Montana State Library's Natural Resource Information System operated by the University of Montana.

# Model Icons Suitable (native range) Optimal Suitability Moderate Suitability Low Suitability

Suitable (introduced range)



Migratory Range

**H** Historic Range

Num Obs
Count of obs with
'good precision'
(<=1000m)
+ indicates

additional 'poor

(1001m-10,000m)

precision' obs

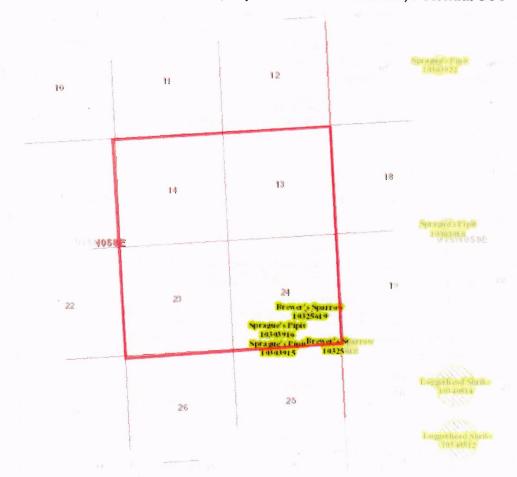


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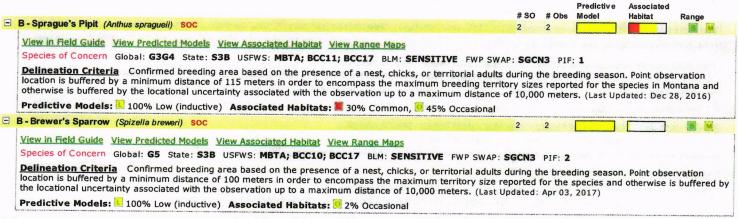
# **Species Summary**

Filtered by:

MT\_Status='Species of Concern','Special Status','Important Animal Habitat','Potential SOC'



# **Species Occurrences**

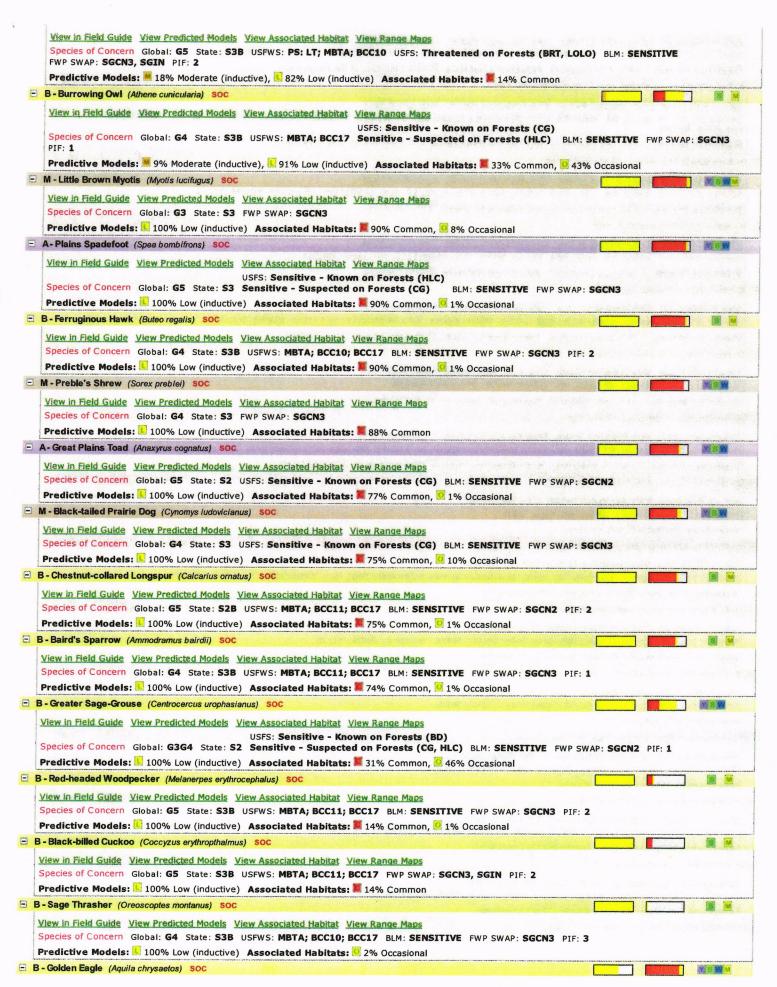


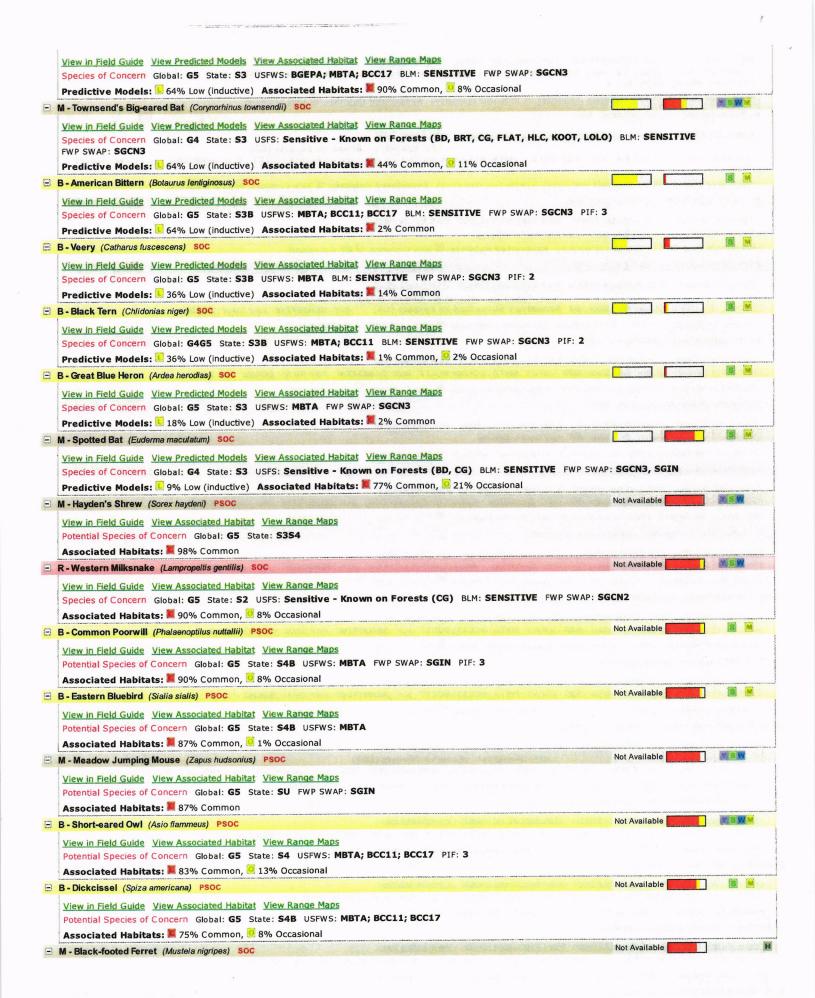
# **Other Observed Species**

		Predictive	Associated	
C D Sharp failed Course (T	# Obs	Model	Habitat	Range
☐ B - Sharp-tailed Grouse (Tympanuchus phasianellus) SOC	1	Not Available		MSW

```
View in Field Guide View Associated Habitat View Range Maps
    Species of Concern Global: G5 State: SX,S4 FWP SWAP: SGCN1 PIF: 2
    Associated Habitats: 387% Common, 88% Occasional
                                                                                                                    Not Available
M - Swift Fox (Vulpes velox) SOC
    View in Field Guide View Associated Habitat View Range Maps
    Species of Concern Global: G3 State: S3 BLM: SENSITIVE FWP SWAP: SGCN3
    Associated Habitats: 18 30% Common, 47% Occasional
Other Potential Species
                                                                                                                     Predictive
                                                                                                                               Habitat
                                                                                                                                          Range
B - Loggerhead Shrike (Lanius Iudovicianus) SOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
    Species of Concern Global: G4 State: S3B USFWS: MBTA; BCC10; BCC17 BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2
    Predictive Models: 100% Moderate (inductive) Associated Habitats: 90% Common, 98% Occasional
R - Greater Short-horned Lizard (Phrynosoma hernandesi) SOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
                                            USFS: Sensitive - Known on Forests (CG)
    Species of Concern Global: G5 State: S3 Sensitive - Suspected on Forests (HLC) BLM: SENSITIVE FWP SWAP: SGCN3, SGIN
    Predictive Models: M 100% Moderate (inductive) Associated Habitats: 77% Common
B - Bobolink (Dolichonyx oryzivorus) SOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
    Species of Concern Global: G5 State: S3B USFWS: MBTA FWP SWAP: SGCN3 PIF: 3
    Predictive Models: M 100% Moderate (inductive) Associated Habitats: 40% Common, 91% Occasional
M - Merriam's Shrew (Sorex merriami) SOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
    Species of Concern Global: G4 State: S3 FWP SWAP: SGCN3
    Predictive Models: 📕 91% Moderate (inductive), 🖳 9% Low (inductive) 🛮 Associated Habitats: 🌹 74% Common, 🚨 3% Occasional
- A-Northern Leopard Frog (Lithobates pipiens) SOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
                                               USFS: Sensitive - Known on Forests (CG, HLC, KOOT)
    Species of Concern Global: G5 State: S1,S4 Sensitive - Suspected on Forests (BRT, FLAT, LOLO) BLM: SENSITIVE FWP SWAP: SGCN1
    Predictive Models: 82% Moderate (inductive), 18% Low (inductive) Associated Habitats: 2% Common, 13% Occasional
   M - Hoary Bat (Lasiurus cinereus) SOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
    Species of Concern Global: G3G4 State: S3 FWP SWAP: SGCN3
    Predictive Models: 🗏 55% Moderate (inductive), 🗓 45% Low (inductive) Associated Habitats: 📕 44% Common, 🚨 54% Occasional
   M - Silver-haired Bat (Lasionycteris noctivagans) PSOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
    Potential Species of Concern Global: G3G4 State: S4
    Predictive Models: 💆 45% Moderate (inductive), 🖳 55% Low (inductive) 🛮 Associated Habitats: 📕 44% Common, 💆 8% Occasional
   M - Eastern Red Bat (Lasiurus borealis) PSOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
     Potential Species of Concern Global: G3G4 State: SU
     Predictive Models: 🗏 45% Moderate (inductive), 💴 55% Low (inductive) 🛮 Associated Habitats: 🌉 14% Common, 🚨 75% Occasional
 R - Plains Hog-nosed Snake (Heterodon nasicus) SOC
    View in Field Guide View Predicted Models View Associated Habitat View Range Maps
     Species of Concern Global: G5 State: S2 USFS: Sensitive - Known on Forests (CG) BLM: SENSITIVE FWP SWAP: SGCN2, SGIN
     Predictive Models: 18% Moderate (inductive), 18 82% Low (inductive) Associated Habitats: 77% Common, 19 1% Occasional
 M - Dwarf Shrew (Sorex nanus) SOC
     View in Field Guide View Predicted Models View Associated Habitat View Range Maps
     Species of Concern Global: G4 State: S2S3 FWP SWAP: SGCN2-3
     Predictive Models: 📕 18% Moderate (inductive), 🖳 82% Low (inductive) 🛮 Associated Habitats: 📕 34% Common, 💹 1% Occasional
 B - Long-billed Curlew (Numenius americanus) SOC
     View in Field Guide View Predicted Models View Associated Habitat View Range Maps
     Species of Concern Global: G5 State: S3B USFWS: MBTA; BCC10; BCC11; BCC17 BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2
     Predictive Models: 📕 18% Moderate (inductive), 🖳 82% Low (inductive) 🛮 Associated Habitats: 📕 30% Common, 💆 45% Occasional
```

■ B - Yellow-billed Cuckoo (Coccyzus americanus) SOC





	View in Field Guide View Associated Habitat View Range Maps Species of Concern FWP SWAP: SGCN1  View Associated Habitat View Range Maps USFWS: LE,XN USFS: Endangered, Experimental Nonessential on Forest	s (CG) BLM: SPECIAL	. STATUS
	Associated Habitats: 75% Common		
4	M - White-footed Mouse (Peromyscus leucopus) PSOC	Not Available	Maw
	View in Field Guide View Associated Habitat View Range Maps Potential Species of Concern Global: G5 State: S4		
*	Associated Habitats: ■ 53% Common		
1	M - Porcupine (Erethizon dorsatum) PSOC	Not Available	Maw
	View in Field Guide View Associated Habitat View Range Maps  Potential Species of Concern Global: G5 State: S4 FWP SWAP: SGIN  Associated Habitats: ■ 44% Common, 43% Occasional		
E	B - Mountain Plover (Charadrius montanus) SOC		
	View in Field Guide View Associated Habitat View Range Maps	Not Available	M
	Species of Concern Global: G3 State: S2B USFWS: MBTA; BCC11; BCC17 BLM: SENSITIVE FWP SWAP: SGCN2 PIF: 1  Associated Habitats: 33% Common		
E	B - McCown's Longspur (Rhynchophanes mccownii) SOC		na dina dia kangana dia kangana kangan Mananana
NES	View in Field Guide View Associated Habitat View Range Maps	Not Available	
	Species of Concern Global: G4 State: S3B USFWS: MBTA; BCC10; BCC11; BCC17 BLM: SENSITIVE FWP SWAP: SGCN3		
	Associated Habitats: \$\mathbb{M}\$ 30% Common, \$\mathbb{O}\$ 11% Occasional	PIF: 2	
E	B - Chimney Swift (Chaetura pelagica) PSOC		600 (m)
	View in Field Guide View Associated Habitat View Range Maps	Not Available	
	Potential Species of Concern Global: G4G5 State: S3S4B USFWS: MBTA FWP SWAP: SGIN PIF: 3		
	Associated Habitats: 15% Common, 84% Occasional		
E	M - Grizzly Bear (Ursus arctos) SOC	Not Available	W
	View in Field Guide View Associated Habitat View Range Maps	NOT Available	
	Species of Concern Global: G4 State: S2S3 USFWS: PS: LT; XN; DM USFS: Threatened on Forests (BD, CG, FLAT, HLOBER: SENSITIVE FWP SWAP: SGCN2-3	C, KOOT, LOLO)	
STATISME	Associated Habitats: 14% Common, 30% Occasional		4-62-15
	I - Polygonia progne (Gray Comma) SOC	Not Available	WSW
	View in Field Guide View Associated Habitat View Range Maps Species of Concern Global: G5 State: S2	And the self-	
Tacher	Associated Habitats: 14% Common, 2 3% Occasional		-4-19-19
	B - Black-and-white Warbler (Mniotilta varia) PSOC	Not Available	
	View in Field Guide View Associated Habitat View Range Maps		
	Potential Species of Concern Global: G5 State: S4B USFWS: MBTA		PROPERTY OF
lam's	Associated Habitats: 14% Common, 11% Occasional	totally at the part of the second	
	,我们就是一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个	Not Available	MSMW
	View in Field Guide View Associated Habitat View Range Maps		
	Potential Species of Concern Global: G5 State: S3S4 USFWS: MBTA PIF: 3  Associated Habitats: 14% Common		
	B - Ovenbird (Seiurus aurocapilla) PSOC		
front		Not Available	
	View in Field Guide View Associated Habitat View Range Maps Potential Species of Concern Global: G5 State: S4B USFWS: MBTA PIF: 3		
	Associated Habitats: 14% Common		
	BPlumbeaus Virgo (Virgo clumbous) PEGG		
	View in Field Guide View Associated Habitat View Range Maps	lot Available	
	Potential Species of Concern Global: G5 State: S3S4B USFWS: MBTA PIF: 3		
The same of the sa	Associated Habitats: 14% Common		200
	B - Bald Eagle (Haliaeetus leucocephalus) SSS	lot Available	
Mary Christian	View in Field Guide View Associated Habitat View Range Maps	o	
The state of the s	Special Status Species Global: G5 State: S4 USFWS: DM: RGEPA: MRTA: RCC10: RCC11: RCC17		era diament
Section 201	USFS: Sensitive - Known on Forests (BD, BRT, CG, FLAT, HLC, KOOT, LOLO) BLM: SENSITIVE PIF: 2		
_ [	Associated Habitats: 2% Common, 273% Occasional		
- 1		ot Available	NSWM
-	View in Field Guide View Associated Habitat View Range Maps		5 35 5 8
all the state of the	Species of Concern Global: G4 State: S3 USFWS: DM; MBTA; BCC10; BCC11; BCC17 USFS: Sensitive - Known on Forests (BD, BRT, CG, FLAT, HLC, KOOT, LOLO) BLM: SENSITIVE FWP SWAP: SGCN3 PIF:		257 13 15
and the second	Associated Habitats: 2% Common, 330% Occasional		Lara Visita
	3-Whooping Crane (Grue provious) 500	ot Available	(100)

View in Field Guide View Associated Habitat View Range Maps  Species of Concern Global: G1 State: S1M USFWS: LE; MBTA BLM: SPECIAL STATUS FWP SWAP: SGCN1	
Associated Habitats: 2% Common, 28% Occasional	
B - Pinyon Jay (Gymnorhinus cyanocephalus) SOC	Not Available Miswi
View in Field Guide View Associated Habitat View Range Maps Species of Concern Global: G5 State: S3 USFWS: MBTA; BCC17 FWP SWAP: SGCN3	
Associated Habitats: 2% Common, 2 1% Occasional	ACCUPATION OF STREET, ACCUPATION OF
M - Bison (Bos bison) SOC	Not Available H
View in Field Guide View Associated Habitat View Range Maps	
Species of Concern Global: G4 State: S2 FWP SWAP: SGCN2	
Associated Habitats: 2% Common, 2 1% Occasional	
R - Snapping Turtle (Chelydra serpentina) SOC	Not Available Section 1
View in Field Guide View Associated Habitat View Range Maps Species of Concern Global: G5 State: S3 BLM: SENSITIVE FWP SWAP: SGCN3, SGIN	
Associated Habitats: 2% Common	Not Available
R - Spiny Softshell (Apalone spinifera) SOC	nga makala sanggang naggapan dan magalak na
View in Field Guide View Associated Habitat View Range Maps	
Species of Concern Global: G5 State: S3 BLM: SENSITIVE FWP SWAP: SGCN3  Associated Habitats: 2% Common	# source published the state of the second
CONTRACTOR OF THE PROPERTY OF	Not Available WSW
I - Enallagma clausum (Alkali Bluet) PSOC	Company of the second of the s
View in Field Guide View Associated Habitat View Range Maps Potential Species of Concern Global: G5 State: S2S4	
Associated Habitats: 2 2% Occasional	
I-Gomphus externus (Plains Clubtail) PSOC	Not Available XS
View in Field Guide View Associated Habitat View Range Maps	
Potential Species of Concern Global: G5 State: S2S4	
Associated Habitats: 2% Common	Not Available SSW
I - Stylurus intricatus (Brimstone Clubtail) SOC	
View in Field Guide View Associated Habitat View Range Maps Species of Concern Global: G4 State: S1	
Associated Habitats: 2% Common	
B - Black-crowned Night-Heron (Nycticorax nycticorax) SOC	Not Available
View in Field Guide View Associated Habitat View Range Maps Species of Concern Global: G5 State: S3B USFWS: MBTA FWP SWAP: SGCN3 PIF: 3	
Associated Habitats: 2% Common	Employment of the control of the con
B - Common Tern (Sterna hirundo) SOC	Not Available
View in Field Guide View Associated Habitat View Range Maps	
Species of Concern Global: G5 State: S3B USFWS: MBTA BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2	
Associated Habitats: 2% Common	Not Available
B - White-faced Ibis (Plegadis chihi) SOC	Not Available
View in Field Guide View Associated Habitat View Range Maps Species of Concern Global: G5 State: S3B USFWS: MBTA BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2	
Associated Habitats: 2% Common	Not Available
B - Franklin's Gull (Leucophaeus pipixcan) SOC	
View in Field Guide View Associated Habitat View Range Maps  Species of Concern Global: G5 State: S3B USFWS: MBTA BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2	
Associated Habitats: 1% Common, 40% Occasional	Not Available Mgs W
I - Arigomphus cornutus (Horned Clubtail) PSOC	
View in Field Guide View Associated Habitat View Range Maps Potential Species of Concern Global: G4 State: \$254	
Associated Habitats: ■ 1% Common, 0.2% Occasional	
I - Coenagrion angulatum (Prairie Bluet) PSOC	Not Available Ms Ms Ms
View in Field Guide View Associated Habitat View Range Maps Potential Species of Concern Global: G5 State: S1S3	
Associated Habitats: 1 1% Common, 2 2% Occasional	
- I - Enallagma civile (Familiar Bluet) PSOC	Not Available MS M
View in Field Guide View Associated Habitat View Range Maps	
Potential Species of Concern Global: G5 State: S2S4	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

-	I - Gomphus graslinellus (Pronghorn Clubtail) PSOC	Not Available	MSW
	View in Field Guide View Associated Habitat View Range Maps		
	Potential Species of Concern Global: G5 State: S3S5		
	Associated Habitats: 1% Common, 2% Occasional		
E	B - Black-necked Stilt (Himantopus mexicanus) SOC	Not Available	Table M.
	View in Field Guide View Associated Habitat View Range Maps		
	Species of Concern Global: G5 State: S3B USFWS: MBTA FWP SWAP: SGCN3 PIF: 3		
	Associated Habitats: 1 1% Common, 2 2% Occasional		
	B - Caspian Tern (Hydroprogne caspia) SOC	Not Available	7
	View in Field Guide View Associated Habitat View Range Maps	Hot / Hallable	
	Species of Concern Global: G5 State: S2B USFWS: MBTA BLM: SENSITIVE FWP SWAP: SGCN2 PIF: 2		
	Associated Habitats: 1% Common, 22% Occasional		
E		******************************	
-		Not Available	at the Maria
	View in Field Guide View Associated Habitat View Range Maps		
	Species of Concern Global: G5 State: S3B USFWS: MBTA BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2		
December 1	Associated Habitats: 1% Common, 2% Occasional	the order a medificial ambitist and transfers continue to the second of the second of the second of the second	
	B - Hooded Merganser (Lophodytes cucullatus) PSOC	Not Available	M
	View in Field Guide View Associated Habitat View Range Maps		
	Potential Species of Concern Global: G5 State: S4 USFWS: MBTA FWP SWAP: SGIN PIF: 2		
	Associated Habitats: ■ 1% Common, ■ 2% Occasional		
$\Box$	B - Horned Grebe (Podiceps auritus) SOC	Not Available	] M
	View in Field Guide View Associated Habitat View Range Maps		
	Species of Concern Global: G5 State: S3B USFWS: MBTA; BCC11; BCC17 FWP SWAP: SGCN3 PIF: 2		
	Associated Habitats: 1% Common, 2% Occasional		
⊟	I - Sympetrum madidum (Red-veined Meadowhawk) PSOC	Not Available	7 200
5-25-0-55	View in Field Guide View Associated Habitat View Range Maps	Hot rivaliable	
	Potential Species of Concern Global: G5 State: S2S3		
	Associated Habitats: 1% Common, 9 1% Occasional		
F	I - Aeshna constricta (Lance-tipped Darner) PSOC		7 000000000
		Not Available	MSM
	View in Field Guide View Associated Habitat View Range Maps Potential Species of Concern Global: G5 State: S1S3		
	Associated Habitats: 1% Common		
	I-Argia emma (Emma's Dancer) PSOC		· · · · · · · · · · · · · · · · · · ·
		Not Available	M5M
	View in Field Guide View Associated Habitat View Range Maps		
	Potential Species of Concern Global: G5 State: S3S5		
NAME OF TAXABLE PARTY.	Associated Habitats: 1% Common		
	I - Enallagma praevarum (Arroyo Bluet) PSOC	Not Available	MSM
	View in Field Guide View Associated Habitat View Range Maps		
	Potential Species of Concern Global: G5 State: S3S5		
	Associated Habitats: 1% Common		
	B - Evening Grosbeak (Coccothraustes vespertinus) SOC	Not Available	Maria de la companya
	View in Field Guide View Associated Habitat View Range Maps		Access
	Species of Concern Global: G5 State: S3 USFWS: MBTA FWP SWAP: SGCN3		and the same of th
	Associated Habitats: ■ 1% Common		
	B - American White Pelican (Pelecanus erythrorhynchos) SOC	Not Available	
	View in Field Guide View Associated Habitat View Range Maps		the state of the s
	Species of Concern Global: G4 State: S3B USFWS: MBTA FWP SWAP: SGCN3 PIF: 3		
-	Associated Habitats: 1% Common		
	B - Barrow's Goldeneye (Bucephala islandica) PSOC		502
		Not Available	Marie Constant
	View in Field Guide View Associated Habitat View Range Maps		
-	Potential Species of Concern Global: G5 State: S4 USFWS: MBTA FWP SWAP: SGIN PIF: 2		
	Associated Habitats: 1% Common	tis otherwiselings in another the entry of the entry in a second representation and an	
	3 - Clark's Grebe (Aechmophorus clarkii) SOC	Not Available	M .
and the same	View in Field Guide View Associated Habitat View Range Maps		
	Species of Concern Global: G5 State: S3B USFWS: MBTA FWP SWAP: SGCN3 PIF: 3		
24	Associated Habitats: 1/2 Common		a department
<b>E E</b>	3 - Common Loon (Gavia immer) SOC	Not Available	

View in Field Guide View Associated Habitat Species of Concern Global: G5 State: S3B Associated Habitats: ■ 1% Common	<u>View Range Maps</u> USFWS: <b>MBTA</b> USFS: <b>Sensitive - Known on Forests (FLAT, KOOT, LOLO)</b>	FWP SWAP: SGCN3 PIF: 1
B - Piping Plover (Charactrius melodus) SOC	THE STREET STREET	Not Available
View in Field Guide View Associated Habitat	View Range Maps USFWS: LT; MBTA BLM: SPECIAL STATUS FWP SWAP: SGCN2 PIF: 1	
B - Trumpeter Swan (Cygnus buccinator) SOC	under Made (1877 and 1878)	Not Available
View in Field Guide View Associated Habitat Species of Concern Global: G4 State: S3 Associated Habitats: ■ 1% Common	View Range Maps USFWS: MBTA USFS: Sensitive - Known on Forests (BD, CG) BLM: SENST	TIVE FWP SWAP: SGCN3 PIF: 1



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# **Structured Surveys**

The Montana Natural Heritage Program (MTNHP) records information on the locations where more than 80 different types of well-defined repeatable survey protocols capable of detecting an animal species or suite of animal species have been conducted by state, federal, tribal, university, or private consulting biologists. Examples of structured survey protocols tracked by MTNHP include: visual encounter and dip net surveys for pond breeding amphibians, point counts for birds, call playback surveys for selected bird species, visual surveys of migrating raptors, kick net stream reach surveys for macroinvertebrates, visual encounter cover object surveys for terrestrial mollusks, bat acoustic or mist net surveys, pitfall and/or snap trap surveys for small terrestrial mammals, track or camera trap surveys for large mammals, and trap surveys for turtles. Whenever possible, photographs of survey locations are stored in MTNHP databases.

MTNHP does not typically manage information on structured surveys for plants; surveys for invasive species may be a future exception.

Within the report area you have requested, structured surveys are summarized by the number of each type of structured survey protocol that has been conducted, the number of species detections/observations resulting from these surveys, and the most recent year a survey has been conducted.

B-Grid-based Point Count (RMBO Generalized Random-tesselation Stratification)	Survey Count: 22	Obs Count: 104	Recent Survey: 2010
B-Point Count (Bird Point Count)	Survey Count: 1	Obs Count: 5	Recent Survey: 2008
B-Raptor nest (Raptor Nest Survey)	Survey Count: 2	Obs Count: 2	Recent Survey: 2016

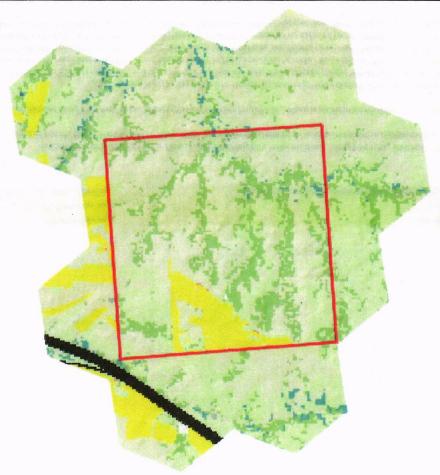


Aprogram of the Montana State Library's Natural Resource Information System operated by the University of Montana.

# 47.0203 47.0780

Latitude Longitude 47.02038 -104.28313 47.07803 -104.37225

# **Land Cover Summary**



#### 7,028 Acres (0.01% of Montana)

Notes on and Appropriate Uses of Land Cover

The Land Cover data used in Map Viewer are based on classifications of 30-meter Landsat satellite imagery. The base data were classified as part of the national ReGAP project, using imagery from the late 1990s and early 2000s. Classification accuracy varies from system to system, but statewide and local assessments have not been completed to-date. Generally, systems occurring as small patches (e.g., fens, mountain mahogany shrublands) or those making up smaller percentages of various administrative boundaries (e.g. all of those listed under the Additional Limited Land Cover folder below) will be less accurately classified than systems occurring as matrices or large patches (e.g., mixed grass prairie, lodgepole pine forests). Similarly, areas where land use and land cover has changed significantly over the past decade may not be correctly classified. Users are cautioned that the appropriate scale for use of the data is 1:100,000. Accuracy improvements are ongoing. To submit updated information, please email **mtnhp@mt.gov**.



43% (3,015 Acres) Grassland Systems
Lowland/Prairie Grassland

#### **Great Plains Sand Prairie**

The sand prairies constitute a very unique system within the western Great Plains. The unifying and controlling feature for this system is that coarse-textured soils predominate and the dominant grasses are well-adapted to this condition. In the northwestern portion of the system's range, stand size corresponds to the area of exposed caprock sandstone, and small patches predominate, but larger patches are found embedded in the encompassing Great Plains Mixed Grass Prairie, and usually occupy higher positions in local landscapes where former caprock formations have eroded into more subdued and planar topography. In most of eastern Montana, substrates supporting this system have weathered in place from sandstone caprock. Soils can be relatively thin or deep due to varying amounts of downslope movement of weathered sands. Needle and thread (Hesperostipa comata) is the dominant grass species. Other frequent species include little bluestem (Schizachyrium scoparium), often occurring with threadleaf sedge (Carex filifolia) and dominating both sandy sites and actively eroding sites. Prairie sandreed (Calamovilfa longifolia), sand bluestem (Andropogon hallii) and big bluestem (Andropogon gerardii) are sporadically distributed and found generally on the coarsest-textured sands. Other graminoids include bluebunch wheatgrass (Pseudoroegneria spicata), sun sedge (Carex inops ssp. heliophila), and purple threeawn (Aristida purpurea). Characteristic forbs differ by occurrence, but species of

scurf pea (*Psoralidium* species) and Indian breadroot (*Pediomelum*) species are common. Communities of silver sage (*Artemisia cana* ssp. *cana*) or skunkbush sumac (*Rhus trilobata*) can occur within this system. Wind erosion, fire and grazing constitute the other major dynamic processes that can influence this system.



30% (2,100 Acres)

Grassland Systems
Lowland/Prairie Grassland

## Great Plains Mixedgrass Prairie

The system covers much of the eastern two-thirds of Montana, occurring continuously for hundreds of square kilometers, interrupted only by wetland/riparian areas or sand prairies. Soils are primarily fine and medium-textured. The growing season averages 115 days, ranging from 100 days on the Canadian border to 130 days on the Wyoming border. Climate is typical of mid-continental regions with long severe winters and hot summers. Grasses typically comprise the greatest canopy cover, and western wheatgrass (Pascopyrum smithii) is usually dominant. Other species include thickspike wheatgrass (Elymus lanceolatus), green needlegrass (Nassella viridula), blue grama (Bouteloua gracilis), and needle and thread (Hesperostipa comata). Near the Canadian border in north-central Montana, this system grades into rough fescue (Festuca campestris) and Idaho fescue (Festuca idahoensis) grasslands. Remnants of shortbristle needle and thread (Hesperostipa curtiseta) dominated vegetation are found in northermost Montana and North Dakota, and are associated with productive sites, now mostly converted to farmland. Forb diversity is typically high. In areas of southeastern and central Montana where sagebrush steppe borders the mixed grass prairie, common plant associations include Wyoming big sagebrush-western wheatgrass (Artemisia tridentata ssp. wyomingensis/ Pascopyrum smithii). Fire and grazing are the primary drivers of this system. Drought can also impact it, in general favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such as Kentucky bluegrass (Poa pratensis), smooth brome (Bromus inermis), and Japanese brome (Bromus japonicus) increase in dominance; both of these rhizomatous species have been shown to markedly decrease species diversity. Previously cultivated acres that have been re-vegetated with non-native plants have been transformed into associations such as Kentucky bluegrass (Poa pratensis)/western wheatgrass (Pascopyrum smithii) or into pure crested wheatgrass (Agropyron cristatum) stands.



13% (907 Acres)

# Forest and Woodland Systems Deciduous dominated forest and woodland

## **Great Plains Wooded Draw and Ravine**

This system is typically associated with highly intermittent or ephemeral streams. It may occur on steep northern slopes or within canyon bottoms where soil moisture and topography produce higher moisture levels than are common throughout most of the area. In some areas of the western Great Plains, in higher elevation draws and ravines, Rocky Mountain juniper (Juniperus scopulorum) can dominate the canopy. Aspen (Populus tremuloides), paper birch (Betula papyrifera), or boxelder maple (Acer negundo) are commonly present in portions of the northwestern Great Plains. In central and eastern Montana, green ash (Fraxinus pennsylvanicus) or chokecherry (Prunus virginiana) are the usual dominants. Douglas hawthome (Crataegus douglasii) is occasionally seen as a dominant in south-central Montana, especially around the Pryor Mountains. This system is found in ravines formed by ephemeral and intermittent streams, and on toeslopes and north-facing backslopes. Generally, these systems are less than 50 meters (165 feet) wide, although the linear extent may be considerable. Soils are usually deep and loamy. Flooding is very short in duration when it occurs, as water is rapidly channeled downslope.



8% (577 Acres)

Human Land Use Agriculture

# Cultivated Crops

These areas used for the production of crops, such as com, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.



3% (187 Acres)

# Sparse and Barren Systems Bluff, Badland and Dune

#### **Great Plains Badlands**

The Western Great Plains Badlands ecological system occurs within the mixed grass and sand prairie regions of eastern and southeastern Montana, where the land lies well above or below its local base level, shaped by the carving action of streams, erosion, and erosible parent material. It is easily recognized by its rugged, eroded, and often colorful land formations, and the relative absence of vegetative cover. In those areas with vegetation, species can include scattered individuals of many dryland shrubs or herbaceous taxa, including curlycup gumweed (*Grindelia squarrosa*), threadleaf snakeweed (*Gutierrezia sarothrae*) (especially with overuse and grazing), greasewood (*Sarcobatus vermiculatus*), Gardner's saltbush (*Atriplex gardneri*), buckwheat (*Eriogonum* species), plains muhly (*Muhlenbergia cuspidata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and Hooker〙s sandwort (*Arenaria hookeri*). Patches of sagebrush (*Artemisia* spp.) can also occur. Climate is typical of mid continental regions with long severe winters and warm summers. Precipitation ranges from 7 to 14 inches per year, with two-thirds of the precipitation falling during the summer, and a third falling in the spring. The sedimentary parent material of exposed rocks and the resultant eroded clay soils are derived from Cretaceous sea beds and are often fossil-rich. Dominant soil types are in the order Entisols. These mineral soils are found primarily on uplands, slopes, and creek bottoms and are easily erodible. The growing season is short, averaging 115 days, with a range from 100 days on the Canadian border to 130 days on the Wyoming border. Land use is limited, except for off-highway vehicle recreation and incidental grazing.

2% (*110 Acres*) Human Land Use Developed



National Highway System (NHS) limited access highways and their shoulders and rights of way.

2% (109 Acres)

Wetland and Riparian Systems
Floodplain and Riparian



#### **Great Plains Riparian**



This system is associated with perennial to intermittent or ephemeral streams throughout the northwestern Great Plains. In Montana, it occurs along smaller tributaries of the Yellowstone and Missouri rivers, as well as tributaries to the large floodplain rivers that feed them (e.g. the Milk, Marias, Musselshell, Powder, Clark's Fork Yellowstone, Tongue, etc). In areas adjacent to the mountain ranges of central and southeastern Montana, and near the Rocky Mountain Front, it grades into Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland systems. This system is found on alluvial soils in highly variable landscape settings, from confined, deep cut ravines to wide, braided streambeds. Channel migration occurs in less-confined areas, but within a more narrow range than would occur in broad, alluvial floodplains. Typically, the rivers are wadeable by mid-summer.

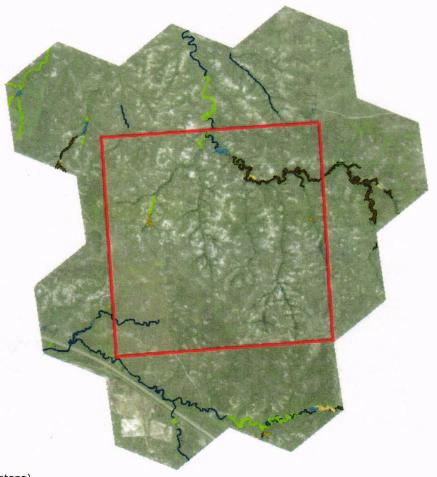
The primary inputs of water to these systems include groundwater discharge, overland flow, and subsurface interflow from the adjacent upland. Flooding is the key ecosystem process, creating suitable sites for seed dispersal and seedling establishment, and controlling vegetation succession. Communities within this system range from riparian forests and shrublands to tallgrass wet meadows and gravel/sand flats. Dominant species are similar to those found in the Great Plains Floodplain System. In the western part of the system's range in Montana, the dominant overstory species is black cottonwood (*Populus balsamifera ssp. trichocarpa*) with narrowleaf cottonwood (*Populus angustifolia*) and Plains cottonwood (*Populus deltoides*) occurring as co-dominants in the riparian/floodplain interface near the mountains. Further east, narrowleaf cottonwood and Plains cottonwood become dominant. In wetter systems, the understory is typically willow (*Salix spp.*) and redosier dogwood (*Cornus stolonifera*) with graminoids such as western wheatgrass (*Pascopyrum smithii*) and forbs like American licorice (*Glycyrrhiza lepidota*). In areas where the channel is incised, the understory may be dominated by big sagebrush (*Artemisia tridentata*) or silver sagebrush (*Artemisia cana*). Like floodplain systems, riparian systems are often subjected to overgrazing and/or agriculture and can be heavily degraded, with salt cedar (*Tamarix ramosissima*) and Russian olive (*Eleagnus angustifolia*) replacing native woody vegetation and regrowth. Groundwater depletion and lack of fire have resulted in additional species changes.



Aprogram of the Montana State Library's **Natural Resource Information System** operated by the University of Montana.



# **Wetland Summary**



#### 7,028 Acres (0.01% of Montana)

Notes on Appropriate Uses of Wetland and Riparian Mapping

Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands differently than the NWI. MTNHP Wetland and Riparian Mapping data are intended for use in publications at a scale of 1:12,000 or smaller. Historic wetland mapping is intended for use in publications at a scale of 1:24,000 or smaller. Mapped wetlands do not represent precise wetland boundaries, and digital wetland data cannot substitute for an on-site determination of jurisdictional wetlands.

# Wetland and Riparian Mapping

vectaria and	a Kiparian Mapping		Explain 1
<b>Palustrine</b>		Acres	
PAB	Aquatic Bed	11 Wetlands with vegetation growing on or below the water surface for most of the gr season.	owing
PUS	Unconsolidated Shore	<1 Wetlands with less than 75% areal cover of stones, boulders, or bedrock. AND with less than 30% vegetative cover AND the wetland is irregularly exposed due to seasonal or irregular flooding and subdrying.	sequent
PEM	Emergent	22 Wetlands with erect, rooted herbaceous vegetation present during most of the grow season.	wing
Riverine (R	ivers)		
Intermit	tent		
R4SB	Streambed	24 Active channel that contains periodic water flow.	
Riparian			
Lotic			
Rp1SS	Scrub-Shrub	3 This type of riparian area is dominated by woody vegetation that is less than 6 met	ers (20

feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental

conditions.

Rp1FO Forested
Rp1EM Emergent

## Lentic

Rp2FO Forested

Rp2EM Emergent

- 36 This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.
- 4 Riparian areas that have erect, rooted herbaceous vegetation during most of the growing season.
- <1 This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.
- 2 Riparian areas that have erect, rooted herbaceous vegetation during most of the growing season.



Aprogram of the Montana State Library's Natural Resource Information System operated by the University of Montana.

# **Land Management Summary**



Latitude Longitude 47.02038 -104.28313 47.07803 -104.37225



7,028 Acres (0.01% of Montana)

# **Land Management Summary**

Explain 🗗 Other Boundaries

**Tribal Easements** 

Public Lands

1 State

■ ○ Montana State Trust Lands MT State Trust Owned

422 Acres (6%)

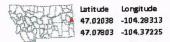
Ownership

422 Acres (6%) 422 Acres (6%)

422 Acres (6%)

Private Lands or Unknown Ownership 6,606 Acres (94%)





# **Biological Reports**

Within the report area you have requested, citations for all reports and publications associated with plant or animal observations in Montana Natural Heritage Program (MTNHP) databases are listed and, where possible, links to the documents are included.

The MTNHP plans to include reports associated with terrestrial and aquatic communities in the future as allowed for by staff resources. If you know of reports or publications associated with species or biological communities within the report area that are not shown in this report, please let us know: <a href="mailto:mtnp@mt.gov">mtnp@mt.gov</a>

Knowles, C. J., P. R. Knowles, B. Giddings, and A. R. Dood. 1995. *Status of the Swift fox in Montana*. [document submitted for publication]. FaunaWest Wildlife Consultants, Boulder, MT, and MT Dept. of FWP, Helena, MT. 16 pp.

Reagan, Katy and Dan Fillipi. 2016. Wibaux Wind Aerial Raptor Nest Survey. Proposed Wibaux Wind Energy Facility. Wibaux County, Montana. Prepared for Wibaux Wind, LLC. 7 pp + appendices

# **Introduction to Montana Natural Heritage Program**







P.O. Box 201800 \* 1515 East Sixth Avenue \* Helena, MT 59620-1800 \* fax 406.444.0266 \* tel 406.444.0241 \* mtnhp.org

## INTRODUCTION

The Montana Natural Heritage Program (MTNHP) is Montana's source for reliable and objective information on Montana's native species and habitats, emphasizing those of conservation concern. MTNHP was created by the Montana legislature in 1983 as part of the Natural Resource Information System (NRIS) at the Montana State Library (MSL). MTNHP is "a program of information acquisition, storage, and retrieval for data relating to the flora, fauna, and biological community types of Montana" (MCA 90-15-102). MTNHP's activities are guided by statute (MCA 90-15) as well as through ongoing interaction with, and feedback from, principal data source agencies such as Montana Fish, Wildlife, and Parks, the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Montana University System, the US Forest Service, and the US Bureau of Land Management. The enabling legislation for MTNHP provides the State Library with the option to contract the operation of the Program. Since 2006, MTNHP has been operated as a program under the Office of the Vice President for Research and Creative Scholarship at the University of Montana (UM) through a renewable 2-year contract with the MSL. Since the first staff was hired in 1985, the Program has logged a long record of success, and developed into a highly respected, service-oriented program. MTNHP is widely recognized as one of the most advanced and effective of over 80 natural heritage programs throughout the Western Hemisphere.

# VISION

Our vision is that public agencies, the private sector, the education sector, and the general public will trust and rely upon MTNHP as the source for information and expertise on Montana's species and habitats, especially those of conservation concern. We strive to provide easy access to our information in order for users to save time and money, speed environmental reviews, and inform decision making.

# CORE VALUES

- We endeavor to be a single statewide source of accurate and up-to-date information on Montana's plants, animals, and aquatic and terrestrial biological communities.
- We actively listen to our data users and work responsively to meet their information and training needs.
- We strive to provide neutral, trusted, timely, and equitable service to all of our information users.
- We make every effort to be transparent to our data users in setting work priorities and providing data products.

#### CONFIDENTIALITY

All information requests made to the Montana Natural Heritage Program are considered library records and are protected from disclosure by the Montana Library Records Confidentiality Act (MCA 22-1-11).

## INFORMATION MANAGED

Information managed at the Montana Natural Heritage Program includes: (1) lists of, and basic information on, plant and animal species and biological communities; (2) plant and animal surveys, observations, species occurrences, predictive distribution models, range polygons, and conservation status ranks; and (3) land cover and wetland and riparian mapping and the conservation status of these and other biological communities.

# **Data Use Terms and Conditions**

- Montana Natural Heritage Program (MTNHP) products and services are based on biological data and the objective
  interpretation of those data by professional scientists. MTNHP does not advocate any particular philosophy of natural
  resource protection, management, development, or public policy.
- MTNHP has no natural resource management or regulatory authority. Products, statements, and services from
  MTNHP are intended to inform parties as to the state of scientific knowledge about certain natural resources, and to
  further develop that knowledge. The information is not intended as natural resource management guidelines or
  prescriptions or a determination of environmental impacts. MTNHP recommends consultation with appropriate
  state, federal, and tribal resource management agencies and authorities in the area where your project is located.
- Information on the status and spatial distribution of biological resources produced by MTNHP are intended to inform
  parties of the state-wide status, known occurrence, or the likelihood of the presence of those resources. These
  products are not intended to substitute for field-collected data, nor are they intended to be the sole basis for
  natural resource management decisions.
- MTNHP does not portray its data as exhaustive or comprehensive inventories of rare species or biological
  communities. Field verification of the absence or presence of sensitive species and biological communities will
  always be an important obligation of users of our data.
- MTNHP responds equally to all requests for products and services, regardless of the purpose or identity of the requester.
- Because MTNHP constantly updates and revises its databases with new data and information, products will become
  outdated over time. Interested parties are encouraged to obtain the most current information possible from MTNHP,
  rather than using older products. We add, review, update, and delete records on a daily basis. Consequently, we
  strongly advise that you update your MTNHP data sets at a minimum of every three months for most applications of
  our information.
- MTNHP data require a certain degree of biological expertise for proper analysis, interpretation, and application. Our staff is available to advise you on questions regarding the interpretation or appropriate use of the data that we provide. Contact information for MTNHP staff is posted at: <a href="http://mtnhp.org/contact.asp">http://mtnhp.org/contact.asp</a>
- The information provided to you by MTNHP may include sensitive data that if publicly released might jeopardize the
  welfare of threatened, endangered, or sensitive species or biological communities. This information is intended for
  distribution or use only within your department, agency, or business. Subcontractors may have access to the data
  during the course of any given project, but should not be given a copy for their use on subsequent, unrelated work.
- MTNHP data are made freely available. Duplication of hard-copy or digital MTNHP products with the intent to sell is
  prohibited without written consent by MTNHP. Should you be asked by individuals outside your organization for the
  type of data that we provide, please refer them to MTNHP.
- MTNHP and appropriate staff members should be appropriately acknowledged as an information source in any thirdparty product involving MTNHP data, reports, papers, publications, or in maps that incorporate MTNHP graphic elements.
- Sources of our data include museum specimens, published and unpublished scientific literature, field surveys by state
  and federal agencies and private contractors, and reports from knowledgeable individuals. MTNHP actively solicits
  and encourages additions, corrections and updates, new observations or collections, and comments on any of the
  data we provide.
- MTNHP staff and contractors do not cross or survey privately-owned lands without express permission from the landowner. However, the program cannot guarantee that information provided to us by others was obtained under adherence to this policy.

# **Suggested Contacts for Natural Resource Agencies**

As required by Montana statute (MCA 90-15), the Montana Natural Heritage Program works with state, federal, tribal, nongovernmental organizations, and private partners to ensure that the latest animal and plant distribution and status information is incorporated into our databases so that it can be used to inform a variety of planning processes and management decisions. In addition to the information you receive from us, we encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located. They may have additional data or management guidelines relevant to your efforts. In particular, we encourage you to contact the Montana Department of Fish, Wildlife, and Parks for the latest data and management information regarding hunted and high profile management species and to use the U.S. Fish and Wildlife Service's Information Planning and Conservation (IPAC) website <a href="http://ecos.fws.gov/ipac/regarding">http://ecos.fws.gov/ipac/regarding U.S. Endangered Species Act listed Threatened, Endangered, or Candidate species.</a>

For your convenience, we have compiled a list of relevant agency contacts and links below:

# Montana Fish, Wildlife, and Parks

Fish Species	Zachary Shattuck <u>zshattuck@mt.gov</u> (406) 444-1231 or Lee Nelson <u>leenelson@mt.gov</u> (406) 444-2447		
American Bison Black-footed Ferret Black-tailed Prairie Dog Bald Eagle Golden Eagle Common Loon Least Tern Piping Plover Whooping Crane	Lauri Hanauska-Brown LHanauska-Brown@mt.gov (406) 444-5209		
Grizzly Bear Greater Sage Grouse Trumpeter Swan Big Game Upland Game Birds Furbearers	John Vore <u>ivore@mt.gov</u> (406) 444-5209		
Managed Terrestrial Game and Nongame Animal Data	Adam Messer – MFWP Data Analyst amesser@mt.gov (406) 444-0095		
Fisheries Data	Bill Daigle – MFWP Fish Data Manager bdaigle@mt.gov (406) 444-3737		
Wildlife and Fisheries	http://fwp.mt.gov/doingBusiness/licenses/scientificWildlife/		
Scientific Collector's	Merissa Hayes for Wildlife merhayes@mt.gov (406) 444-7321		
Permits	Beth Giddings for Fisheries begiddings@mt.gov (406) 444-7319		
Fish and Wildlife	Renee Lemon RLemon@mt.gov (406) 444-3738		
Recommendations for	and see		
Subdivision Development	http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/buildingWithWildlife/subdivisionRecommendations/		
Regional Contacts	Region 1 (Kalispell) (406) 752-5501		
1 4 6 2 3 5 7	Region 2       (Missoula)       (406) 542-5500         Region 3       (Bozeman)       (406) 994-4042         Region 4       (Great Falls)       (406) 454-5840         Region 5       (Billings)       (406) 247-2940         Region 6       (Glasgow)       (406) 228-3700         Region 7       (Miles City)       (406) 234-0900		

#### **United States Fish and Wildlife Service:**

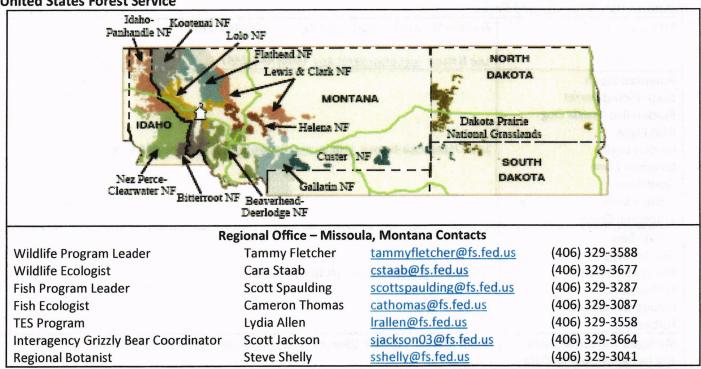
Information Planning and Conservation (IPAC) website: http://ecos.fws.gov/ipac/

Montana Ecological Services Field Office: http://www.fws.gov/montanafieldoffice/ (406) 449-5225

**Bureau of Land Management** 



#### **United States Forest Service**



#### **Tribal Nations**



# **Introduction to Species Summary**

Within the report area you have requested, separate summaries are provided for: (1) Species Occurrences (SO) for plant and animal Species of Concern, Special Status Species (SSS), Important Animal Habitat (IAH) and some Potential Plant Species of Concern; (2) other observed non Species of Concern or Species of Concern without suitable documentation to create Species Occurrence polygons; and (3) other non-documented species that are potentially present based on their range, predicted suitable habitat model output, or presence of associated habitats. Each of these summaries provides the following information when present for a species: (1) the number of Species Occurrences and associated delineation criteria for construction of these polygons that have long been used for considerations of documented Species of Concern in environmental reviews; (2) the number of observations of each species; (3) the geographic range polygons for each species that the report area overlaps; (4) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (5) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (6) a variety of conservation status ranks and links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers below or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document native and introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are restricted by declining budgets, and information is constantly being added and updated in our databases. Thus, field verification by professional biologists of the absence or presence of species and biological communities will always be an important obligation of users of our data.

If you are aware of observation datasets that the MTNHP is missing, please report them to the Program Botanist <a href="mailto:apipp@mt.gov">apipp@mt.gov</a> or Senior Zoologist <a href="mailto:dbachen@mt.gov">dbachen@mt.gov</a>. If you have observations that you would like to contribute, you can submit animal observations using our online data entry system at <a href="http://mtnhp.org/AddObs/">http://mtnhp.org/AddObs/</a>, plant and animal observations via Excel spreadsheets posted at <a href="http://mtnhp.org/observations.asp">http://mtnhp.org/AddObs/</a>, or to the Program Botanist or Senior Zoologist.

#### **Observations**

The MTNHP manages information on more than 1.8 million animal and plant observations that have been reported by professional biologists and private citizens from across Montana. The majority of these observations are submitted in digital format from standardized databases associated with research or monitoring efforts and spreadsheets of incidental observations submitted by professional biologists and amateur naturalists. At a minimum, accepted observation records must contain a credible species identification (i.e. appropriate geographic range, date, and habitat and, if species are difficult to identify, a photograph and notes on key identifying features), a date or date range, observer name, locational information (ideally with latitude and longitude in decimal degrees), notes on numbers observed, and species behavior or habitat use (e.g., is the observation likely associated with reproduction). Bird records are also required to have information associated with date-appropriate breeding or overwintering status of the species observed. MTNHP reviews observation records to ensure that they are mapped correctly, occur within date ranges when the species is known to be present or detectable, occur within the known seasonal geographic range of the species, and occur in appropriate habitats. MTNHP also assigns each record a locational uncertainty value in meters to indicate the spatial precision associated with the record's mapped coordinates. Only records with locational uncertainty values of 10,000 meters or less are included in environmental summary reports and number summaries are only provided for records with locational uncertainty values of 1,000 meters or less.

## **Species Occurrences**

The MTNHP evaluates plant and animal observation records for species of higher conservation concern to determine whether they are worthy of inclusion in the <a href="Species Occurrence">Species Occurrence</a> (SO) layer for use in environmental reviews; observations not worthy of inclusion in this layer include long distance dispersal events, migrants observed away from key migratory stopover habitats, and winter observations. An SO is a polygon depicting what is known about a species occupancy from direct observation with a defined level of locational uncertainty and any inference that can be made about adjacent habitat use from the latest peer-reviewed science. If an observation can be associated with a map feature that can be tracked (e.g., a wetland boundary for a wetland associated plant) then this polygon feature is used to represent the SO. Areas that can be inferred as probable occupied habitat based on direct observation of a species location and what is known about the foraging area or home range size of the species may be incorporated into the SO. Species Occurrences generally belong to one of the following categories:

## **Plant Species Occurrences**

A documented location of a specimen collection or observed plant population. In some instances, adjacent, spatially separated clusters are considered subpopulations and are grouped as one occurrence (e.g., the subpopulations occur in ecologically similar habitats, and their spatial proximity likely allows them to interbreed). Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Plant SO's are only created for Species of Concern and Potential Species of Concern.

# **Animal Species Occurrences**

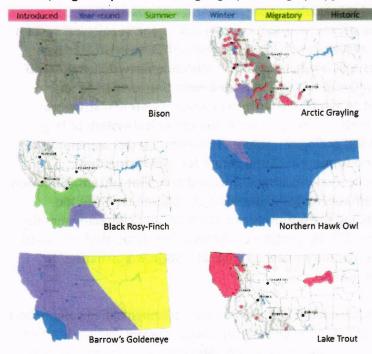
The location of a verified observation or specimen record typically known or assumed to represent a breeding population or a portion of a breeding population. Animal SO's are generally: (1) buffers of terrestrial point observations based on documented species' home range sizes; (2) buffers of stream segments to encompass occupied streams and immediate adjacent riparian habitats; (3) polygonal features encompassing known or likely breeding populations (e.g., a wetland for some amphibians or a forested portion of a mountain range for some wide ranging carnivores); or (4) combinations of the above. Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Species Occurrence polygons may encompass some unsuitable habitat in some instances in order to avoid heavy data processing associated with clipping out habitats that are readily assessed as unsuitable by the data user (e.g., a point buffer of a terrestrial species may overlap into a portion of a lake that is obviously inappropriate habitat for the species). Animal SO's are only created for Species of Concern and Special Status Species (e.g., Bald Eagle).

## Other Occurrence Polygons

These include significant biological features not included in the above categories, such as Important Animal Habitats like bird rookeries and bat roosts, and peatlands or other wetland and riparian communities that support diverse plant and animal communities.

## **Geographic Range Polygons**

Geographic range polygons have not yet been defined for most plant species. Native year-round, summer, winter, migratory and historic geographic range polygons as well as polygons for introduced populations have



been defined for most animal species for which there are enough observations, surveys, and knowledge of appropriate seasonal habitat use to define them (see examples to left). These native or introduced range polygons bound the extent of known or likely occupied habitats for nonmigratory and relative sedentary species and the regular extent of known or likely occupied habitats for migratory and long-distance dispersing species; polygons may include unsuitable intervening habitats. For most species, a single polygon can represent the year-round or seasonal range, but breeding ranges of some colonial nesting water birds and some introduced species are represented more patchily when supported by data. Some ranges are mapped more broadly than actual distributions in order to be visible on statewide maps (e.g., fish).

## **Predicted Suitable Habitat Models**

Recent predicted suitable habitat suitability models have not yet been created for most plant species. For animal species for which models have been completed, the environmental summary report includes simple, rule-based, associations with streams for fish and other aquatic species and mathematically complex Maximum Entropy models (Phillips et al. 2006, Ecological Modeling 190:231-259) constructed from a variety of statewide biotic and abiotic layers and presence only data for individual species contributed to Montana Natural Heritage Program databases for most terrestrial species. For the Maximum Entropy models, we reclassified 90 x 90-meter continuous model output into suitability classes (unsuitable, low, moderate, and optimal) then aggregated that into the one square mile hexagons used in the environmental summary report; this is the finest spatial scale we suggest using this information in management decisions and survey planning. Full model write ups for individual species that discuss model goals, inputs, outputs, and evaluation in much greater detail are posted on the MTNHP's Predicted Suitable Habitat Models page. Evaluations of predictive accuracy and specific limitations are included with the metadata for models of individual species. Model outputs should not be used in place of on-the-ground surveys for species. Instead model outputs should be used in conjunction with habitat evaluations to determine the need for on-the-ground surveys for species. We suggest that the percentage of predicted optimal and moderate suitable habitat within the report area be used in conjunction with geographic range polygons and the percentage of commonly associated habitats to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning.

## **Associated Habitats**

Within the boundary of the intersected hexagons, we provide the approximate percentage of commonly or occasionally associated habitat for vertebrate animal species that regularly breed, overwinter, or migrate through the state; a detailed list of commonly and occasionally associated habitats is provided in individual species accounts in the <a href="Montana Field Guide">Montana Field Guide</a>. We assigned common or occasional use of each of the 82 ecological systems mapped in Montana by: (1) using personal knowledge and reviewing literature that

summarizes the breeding, overwintering, or migratory habitat requirements of each species; (2) evaluating structural characteristics and distribution of each ecological system relative to the species' range and habitat requirements; (3) examining the observation records for each species in the state-wide point observation database associated with each ecological system; and (4) calculating the percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system to get a measure of numbers of observations versus availability of habitat. Species that breed in Montana were only evaluated for breeding habitat use, species that only overwinter in Montana were only evaluated for overwintering habitat use, and species that only migrate through Montana were only evaluated for migratory habitat use. In general, species were listed as associated with an ecological system if structural characteristics of used habitat documented in the literature were present in the ecological system or large numbers of point observations were associated with the ecological system. However, species were not listed as associated with an ecological system if there was no support in the literature for use of structural characteristics in an ecological system, even if point observations were associated with that system. Common versus occasional association with an ecological system was assigned based on the degree to which the structural characteristics of an ecological system matched the preferred structural habitat characteristics for each species as represented in the scientific literature. The percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system was also used to guide assignment of common versus occasional association.

We suggest that the percentage of commonly associated habitat within the report area be used in conjunction with geographic range polygons and the percentage of predicted optimal and moderate suitable habitat from predictive models to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning. Users of this information should be aware that land cover mapping accuracy is particularly problematic when the systems occur as small patches or where the land cover types have been altered over the past decade. Thus, particular caution should be used when using the associations in assessments of smaller areas (e.g., evaluations of public land survey sections).

# **Introduction to Land Cover Summary**

Land Use/Land Cover is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download at the Montana State Library's Geographic Information Clearinghouse.

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

#### **Literature Cited**

Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

# **Introduction to Wetland and Riparian Summary**

Within the report area you have requested, wetland and riparian mapping is summarized by acres of each classification present. Summaries are only provided for modern MTNHP wetland and riparian mapping and not for outdated (NWI Legacy) or incomplete (NWI Scalable) mapping efforts; described here. MTNHP has made all three of these datasets and associated metadata available for separate download on the Montana Wetland and Riparian Framework MSDI download page.

Wetland and Riparian mapping is one of 15 <u>Montana Spatial Data Infrastructure</u> framework layers considered vital for making statewide maps of Montana and understanding its geography. The wetland and riparian framework layer consists of spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deepwater habitats in Montana.

Wetland and riparian mapping is completed through photointerpretation of 1-m resolution color infrared aerial imagery acquired from 2005 or later. A coding convention using letters and numbers is assigned to each mapped wetland. These letters and numbers describe the broad landscape context of the wetland, its vegetation type, its water regime, and the kind of alterations that may have occurred. Ancillary data layers such as topographic maps, digital elevation models, soils data, and other aerial imagery sources are also used to improve mapping accuracy. Wetland mapping follows the federal Wetland Mapping Standard and classifies wetlands according to the Cowardin classification system of the National Wetlands Inventory (NWI) (Cowardin et al. 1979, FGDC Wetlands Subcommittee 2013). Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands differently than the NWI. Similar coding, based on U.S. Fish and Wildlife Service conventions, is applied to riparian areas (U.S. Fish and Wildlife Service 2009). These are mapped areas where vegetation composition and growth is influenced by nearby water bodies, but where soils, plant communities, and hydrology do not display true wetland characteristics. These data are intended for use in publications at a scale of 1:12,000 or smaller. Mapped wetland and riparian areas do not represent precise boundaries and digital wetland data cannot substitute for an on-site determination of jurisdictional wetlands.

A detailed overview, with examples, of both wetland and riparian classification systems and associated codes can be found at: <a href="http://mtnhp.org/help/MapViewer/WetRip">http://mtnhp.org/help/MapViewer/WetRip</a> Classification.asp

# **Literature Cited**

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79/31. Washington, D.C. 103pp.
- Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.
- U.S. Fish and Wildlife Services. 2009. A system for mapping riparian areas in the western United States. Division of Habitat and Resource Conservation, Branch of Resource and Mapping Support, Arlington, Virginia.

# **Introduction to Land Management Summary**

Within the report area you have requested, land management information is summarized by acres of federal, state, and local government lands, tribal reservation boundaries, private conservation lands, and federal, state, local, and private conservation easements. Acreage for "Owned", "Tribal", or "Easement" categories represents non-overlapping areas that may be totaled. However, "Other Boundaries" represents managed areas such as National Forest boundaries containing private inholdings and other mixed ownership which may cause boundaries to overlap (e.g. a wilderness area within a forest). Therefore, acreages may not total in a straight-forward manner.

Because information on land stewardship is critical to effective land management, the Montana Natural Heritage Program (MTNHP) began compiling ownership and management data in 1997. The goal of the Montana Land Management Database is to manage a single, statewide digital data set that incorporates information from both public and private entities. The database assembles information on public lands, private conservation lands, and conservation easements held by state and federal agencies and land trusts and is updated on a regular basis. Since 2011, the Information Management group in the Montana State Library's Digital Library Division has taken an increasingly active role in managing layers of the Montana Land Management Database in partnership with the MTNHP.

Public Lands
Conservation Easements
Private Conservation Lands
Managed Areas

Map features in the Montana Land Management Database or summaries provided in this report are not intended as a legal depiction of public or private surface land ownership boundaries and should not be used in place of a survey conducted by a licensed land surveyor. Similarly, map features do not imply public access to any lands. The Montana Natural Heritage Program makes no representations or warranties whatsoever with respect to the accuracy or completeness of this data and assumes no responsibility for the suitability of the data for a particular purpose. The Montana Natural Heritage Program will not be liable for any damages incurred as a result of errors displayed here. Consumers of this information should review or consult the primary data and information sources to ascertain the viability of the information for their purposes.

# **Additional Information Resources**

Home Page for Montana Natural Heritage Program (MTNHP)

MTNHP Staff Contact Information

Montana Field Guide

MTNHP Species of Concern Report - Animals and Plants

MTNHP Species Status Codes - Explanation

MTNHP Predicted Suitable Habitat Models (for select Animals and Plants)

MTNHP Request Information page

Montana Cadastral

Montana Code Annotated

Montana Department of Environmental Quality

Montana Fisheries Information System

Montana Fish, Wildlife, and Parks Subdivision Recommendations

Montana GIS Data Layers

Montana GIS Data Bundler

Montana Greater Sage-Grouse Project Submittal Site

Montana Ground Water Information Center

Montana Legislative Environmental Policy Office Publications

(Including Index of Environmental Permits required in Montana and Guide to the Montana Environmental Policy Act)

Montana Environmental Policy Act (MEPA)

MEPA Analysis Resource List

Laws, Treaties, Regulations, and Permits on Animals and Plants

Montana Spatial Data Infrastructure Layers

Montana State Historic Preservation Office Review and Compliance

Montana Water Information System

Montana Web Map Services

National Environmental Policy Act

U.S. Fish and Wildlife Service Information for Planning and Conservation (Section 7 Consultation)

Web Soil Survey Tool

# **Introduction to Land Management Summary**

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Public and private conservation land polygons are attributed with the name of the entity that owns it. The data are derived from the statewide Montana Cadastral Parcel layer. Conservation easement data shows land parcels on which a public agency or qualified land trust has placed a conservation easement in cooperation with the land owner. The dataset contains no information about ownership or status of the mineral estate. For questions about the dataset or to report errors, please contact the Montana Natural Heritage Program at (406) 444-5354 or <a href="mailto:mtn.gov">mtnhp@mt.gov</a>. You can download various components of the Land Management Database and view associated metadata at the Montana State Library's <a href="mailto:GIS Data List">GIS Data List</a> at the following links:

Public Lands
Conservation Easements
Private Conservation Lands
Managed Areas

Map features in the Montana Land Management Database or summaries provided in this report are not intended as a legal depiction of public or private surface land ownership boundaries and should not be used in place of a survey conducted by a licensed land surveyor. Similarly, map features do not imply public access to any lands. The Montana Natural Heritage Program makes no representations or warranties whatsoever with respect to the accuracy or completeness of this data and assumes no responsibility for the suitability of the data for a particular purpose. The Montana Natural Heritage Program will not be liable for any damages incurred as a result of errors displayed here. Consumers of this information should review or consult the primary data and information sources to ascertain the viability of the information for their purposes.

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Web Soil Survey Tool